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MASTER THESIS

**Mining diamonds in Namibia—
Addressing environmental and
human development impact**

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Declaration

I hereby declare, that I have written this master thesis myself with help of the literature listed in references.

Prague, 15 April 2012

.....
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Very special thanks and gratitude are extended to my supervisor, Dr. Vladimir Verner for his advices, patience and for believing in my capability to complete this research paper.

I would also like to thank my parents, siblings and friends for their love and support and encouragement during my studies.

Abstract

Namibia is endowed with a rich natural resource base, but the benefits gathered from these diamonds have not trickled down to the local people. One of the most important mining articles are diamonds, whose mining began in the country over a century ago. Before independence, diamonds mined in the country were all exported in rough form to international markets. In return, Namibia benefited from taxes and royalties, but lost out on developing a downstream diamond economy with the potential to create employment, and generate increased income for the state. Even today, 95% of diamond production is exported in rough form to international markets and, therefore, all the benefits delivered from diamonds do not reach the Namibian nation. The objective of the thesis is to analyze the impact of diamond mining industry on the Oranjemund, Karas region, which is one of the most important mining area in Namibia, on human and environmental development. Total number 49 respondents were interviewed through questionnaire. Data were processed via MS Office Excel® and open-source statistical package GRETL® version 1.6.0. The results showed strong negative correlation among following variables observed in mining town and satisfaction with mining: age, education and period stayed ($r=0.9245$, $p=0.0000$). The fact that education does not influence satisfaction with mining, which is obvious looking at the results that those respondents with low level of education seems to be more satisfied with mining compared to those with high level of education, can be explained through overall poverty and low human development. People put higher priority to the incomes that can be generated as salaries and do not consider environmental consequences and/or possibility of vertical integration and added value increase at regional or national level.

Key words: diamond, mining, poverty, economic growth, economic development, maximizing, government, household survey, Namdeb, De beers, environment, pollution, Oranjemund, Namibia.

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List of Abbreviations

AIDS	: Acquired Immune Deficiency Syndrome
DBN	: Development Bank of Namibia
DTC	: Diamond Trading Company
EMS	: Environmental Management System
ESCOM	: Electricity Supply Commission
EU	: European Union
FDI	: Foreign Direct Investment
GDP	: Gross Domestic Product
GNP	: Gross National Product
HDI	: Human Development Index
IFAD	: International Fund for Agricultural Development
HIV	: Human Immunodeficiency Virus
IMF	: Infant Monetary Fund
ISO	: International Organization for Standardization
KPCS	: Kimberly Process Scheme
MLSW	: Ministry of Labour and Social Welfare (Namibia)
MME	: Ministry of Mines and Energy (Namibia)
NAMCO	: Namibian Minerals Corporation
NAMDEB	: Namdeb Diamond Corporation Ltd.
NamZinc	: Namibian Zinc Pty Ltd.
NDTC	: Namibian Diamond Trading Company
NPC	: National Planning Commission
SACU	: Southern African Customs Union
SADC	: Southern African Development Community
UN	: United Nations
UNDP	: United Nations Development Programme

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1. INTRODUCTION

Namibia is a country endowed with a variety of valuable minerals, ranging from copper, zinc, uranium to gold, and, of course, diamonds. National Planning Commission (2008) announced that “the diamond mining sub-sector is one of the major contributors to the Namibian economy in terms of economic output and exports.” The potential of Namibian diamonds cannot be understated and exploring mechanisms to maximise this potential through a beneficiation process is central to this study. The question of maximizing the benefits from diamonds continues to be an imperative discussion in this important sub-sector, and in Namibia as a whole. Diamond beneficiation can be summarized as a plan to promote diamond value addition by turning the natural resource into shared national wealth.

Namibian diamonds have been highly beneficial to the country for many years by creating employment, and contributing revenue to the state through corporate tax, dividends and royalties, but there remains much more scope for the country to further benefit from its diamonds. The revenues from the diamond industry are essential in funding programs of economic development and social transformation and therefore maximizing benefits derived from the diamonds can greatly contribute further to the Namibian economy through increasing national economic activities and improving state revenue, reducing the need for imports, improving the skill level in the minerals industry and widening the employment base (MTM, 2006).

This paper discusses the environment and human development impact of mining activities in Namibia’s largest diamond production town, Oranjemund. In the first chapter, literature review, the role of diamonds in national economy is discussed as well as pros and cons of their mining on economical and environmental situation. Moreover second chapter of literature review discussed the mining strategy and roots of poverty in Namibia, when the country is blessed with resources yet still has high levels of hunger. This paper further discussed the satisfaction of the interviewers with mining industry in the country, who were randomly selected from the diamond town, Oranjemund.

2. LITERATURE REVIEW

2.1 DIAMOND MINING OVERVIEW IN THE WORLD

Generally, several countries worldwide have made various attempts and significant strides in maximising the benefits derived from their diamonds during the last decades. Lamont (2003) argues that the diamond beneficiation process is not a new concept but a developmental initiative, which appeared in the early 1990s when southern African countries began to sensitise each other towards the cultivation of a concept that would ensure that the citizens of their respective countries, would fully benefit from the natural resources of these countries. In contrast to this, Janiurek-Ashipala (2005) argues that full exploitation of the diamond value chain should be beneficial to the producer countries so that employment and economic expansion is made and accelerated for the benefit of its citizens. It is only through this process that producer's countries will feel a sense of ownership to the diamond activities and the benefits that is derived through the resources. According to Kimberly Process statistics (2011) global rough diamond production rose 39% by value in 2010.

Statistics on overall production differ from source to source and huge percentage of total production is believed to be not covered in official numbers. Nevertheless, many articles (MME, 2011) indicated that Botswana seems to remain on top in many occasions, e.g. according to the KPCS (2011) Botswana was the largest producer of rough diamonds by value in 2010 at US\$ 2.59 billion for 22 million carats, but Russia was the top producer by volume at 34.86 million carats valued at US\$ 2.38 billion. It is stated that Russia held the top spot for both categories in the previous year (2009). Other top diamond producers by volume in 2010 were the Democratic Republic of the Congo with 20.17 million carats, South Africa with 13.67 million carats, Canada reported 11.8 million carats, Zimbabwe mined 8.44 million carats and Angola produced 8.36 million carats.

In terms of value for rough diamond production in 2010, Canada ranked third at US\$ 2, 3 billion followed by South Africa with US\$ 1, 8 billion. Other top countries by value included Angola with US\$ 976, 3 million, Namibia at US\$ 744 million, Zimbabwe at US\$ 339, 8 million and Australia with US\$ 251, 7 million.

Taking into consideration diamond production, the position of Namibia is very specific. On the one hand, Namibia has fallen from the world top five diamond producers, but on the other hand, Namibia's diamonds remain the top in the terms of quality. Refer to annex 1.

2.2 DIAMOND AND NAMIBIAN NATIONAL ECONOMY

During the last two decades, Namibia had experienced steady growth, moderate inflation, limited fiscal debt, a robust mining sector, a fairly developed infrastructure, and a strong legal and regulatory environment (World Bank, 2011; IMF, 2012). However, it is important to highlight that Namibian government has been giving wrong figures (Mwinga, 2010) on the unemployment rate because of not strictly following international compilation methods. This led Namibia to be among the top countries in the world according to unemployment rate. Namibia's current real unemployment rate is 28 percent and not the 51.2 percent as given by the MLSW (2008). Nevertheless, according to Mwinga (2010), one of the country's renowned economists running his own private company First Capital, the official figures are wrong because it "underestimates the size of those employed in subsistence farming," and is generally "overstated due to poor data quality, poor sampling and coverage".

During the global economic crisis in 2009 just like all other countries, the Namibian economy was affected since there was low demand for Namibia's commodity exports, mainly diamonds. The crisis also caused reduction in the transfer payments the country receives since it's a member in the Southern African Customs Union (SACU) (Kruger and Wald, 2011). This resulted in Namdeb closed down for 2 months. That situation led to a decline in the economy by -0.8 percent. The government response to such a sudden economic downturn was by running a budget deficit, and fiscal deficits are expected to widen. According to Kruger and Wald (2011) for the next three years, the IMF has projected deficits of 8.1 percent, 7.8 percent, and 3.8 percent of GDP respectively.

It is believed that the contributions of diamonds to the national economy are amongst others manifested in employment creation where the local industry employs more than 5,000 workers. The industry benefits the nation in many ways: it delivers 45% of export revenue, 7% of tax income, 10% of the gross domestic product (GDP) and US\$ 255,299 in Corporate Social Responsibility spending.

According to the African Business (2007), diamond and uranium production have remained one of the backbones of the Namibian economy accounting for 8.0 percent of total GDP, 45 percent of export value and 38 percent of the primary industry output. In 2006 diamond production exceeded 2 million carats and generated over US\$ 200 million in export earnings (Sherbourne, 2007). Chamber of Mines (2007) stated that the industry employs 3,500 of the country's population and contributed close to US\$ 28.5 million to the government in statutory fees and state income (see figure 1 below).

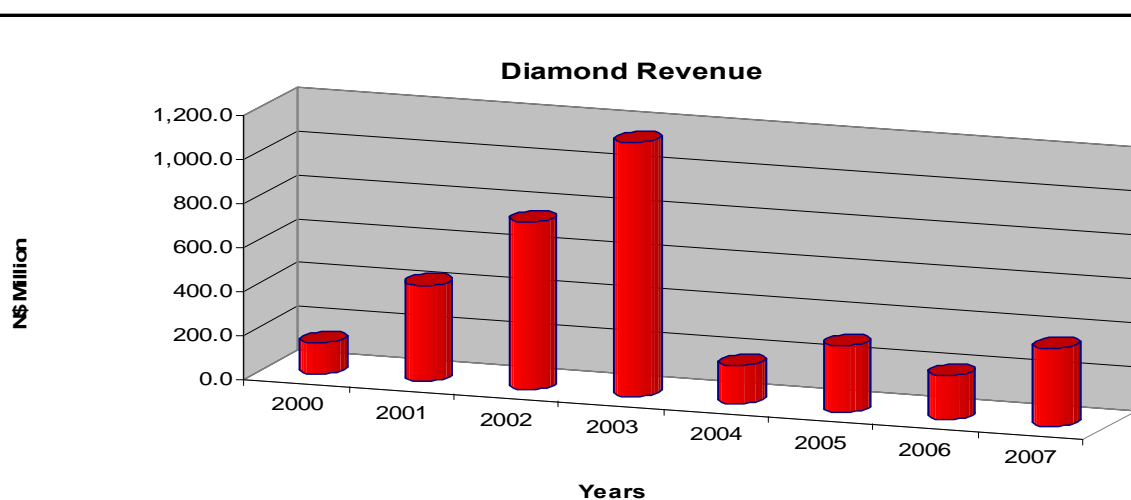


Figure 1 Contribution of diamond industry to Namibian national revenues

Source: Chamber of Mines (2007)

Furthermore, diamond mining output for Namibia (as illustrated in figure 2 below) is projected to grow by 6.1 percent in 2008, driven by offshore mining and high world demand (Bank of Namibia, 2008). On the international front, the market for diamonds is expected to increase by 7.8 percent, driven mainly by high demand from China and India (KPCS, 2007).

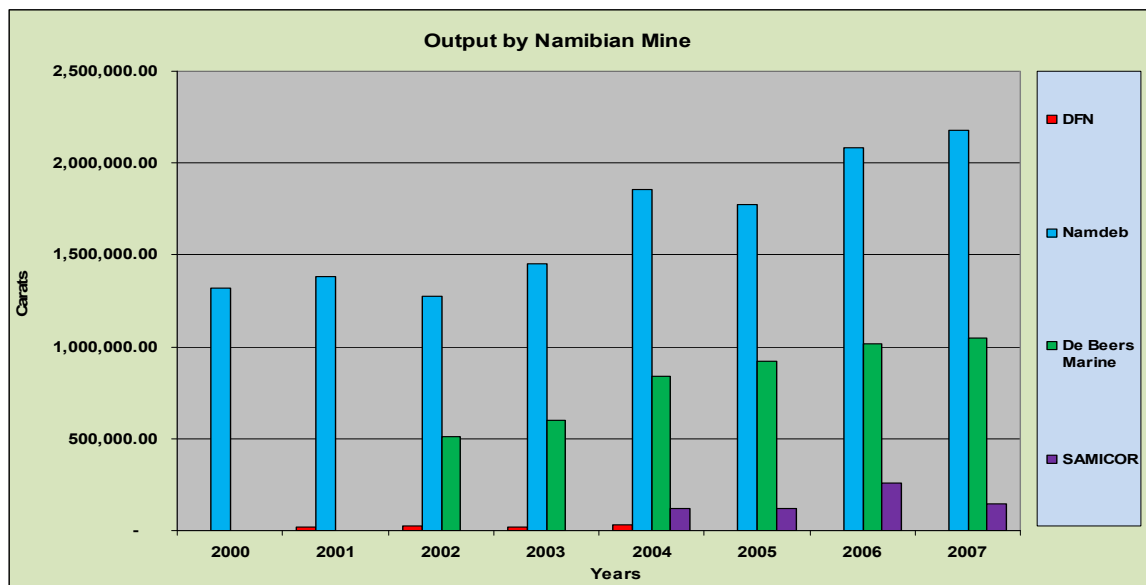


Figure 2 Diamond Output by Namibian Mines

Source: Chamber of Mines (2007)

The supply, on the other hand, is expected not to match the increased demand because of a worldwide shortage and lack of new discoveries. As a result of excess demand, the price for both rough and polished diamonds will continue to be firm and is expected to rise in real terms each year between 2.0 percent and 5.0 percent, or even as high as 10.0 percent for high quality stones (Chamber of Commerce, 2007).

2.2.1 General overview of the Namibian economy and the role of ‘diamond industry’

It is important to understand and gauge the Namibian economy in order to comprehend the impact it has on the maximisation of diamond benefits in the country. The country’s economic sphere will be discussed briefly to ascertain specific characteristics that the economy poses for the benefits of its most lucrative industry – diamonds. According to the Bank of Namibia (2008) the country’s economy has a modern market sector, which produces most of the country’s wealth, and a traditional subsistence sector with per capita GDP relatively high among developing countries. However, despite this economic level, Namibia also has one of the most unequal income distributions in the world (see Table 1 below).

Table 1 Socioeconomic indicators of Namibia (2010)

Indicator	Unit of measure	Value
Total population	millions	2.3
Annual population growth	percentage	1.8
GDP (current US\$)	billions, current US\$	12.2
Per capita GDP	US\$	5,330
Gini coefficient	...	>0.70
Annual GDP growth	percentage	4.8
Life expectancy at birth	years	61.6
Infant mortality rate	per 1,000 live births	29.3
Literacy rate, youth female	percentage of females ages 15-24	94.9
Prevalence of HIV, total	percentage of population ages 15-49	13.1

Source: World Bank (2010)

Although the majority of the population depends on subsistence agriculture and herding, Namibia has more than 200,000 skilled workers, as well as a small, well-trained professional and managerial class. Since independence, the government has pursued free-market economic principles designed to promote commercial development and job creation to bring disadvantaged Namibians into the economic mainstream. Given its small domestic market but favourable location and an excellent transport and communications base, Namibia is a leading advocate of regional economic integration, with SADC as the point of reference (Janiurek-Ashipala, 2005).

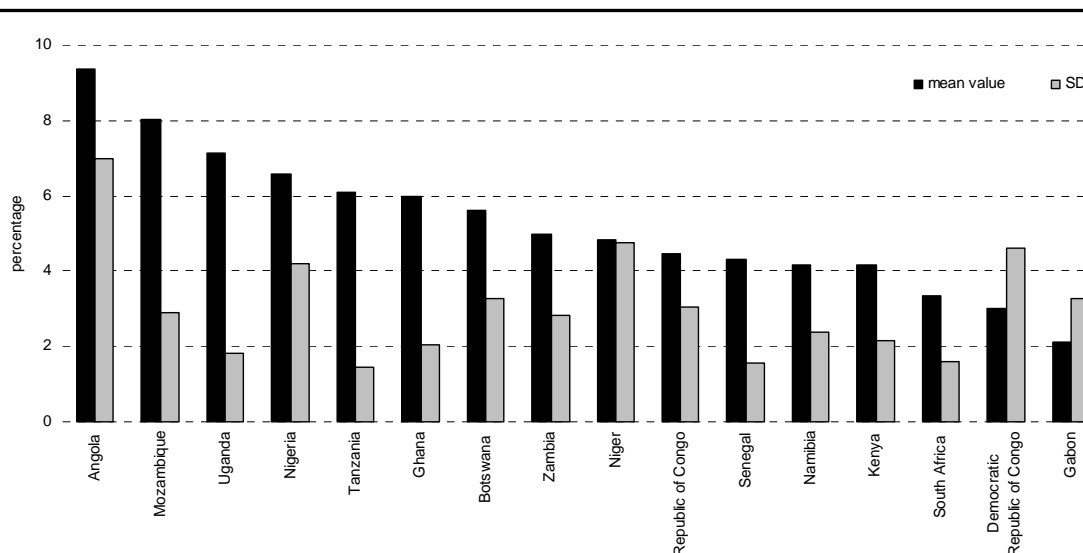


Figure 3 Average annual growth of GDP in selected countries from Sub-Saharan Africa (1995-2015)

Source: IMF (2012)

Generally, it has to be stated that per capita income in Namibia is higher comparing to other countries in Sub-Saharan Africa sub-region. Nevertheless, the Namibia Chamber of Mines (2007) stressed that the economic growth in Namibia is estimated to have slowed down considerably during 2007 to 3.8% comparing to 4.1% in the preceding year. Correspondingly, based on IMF data (IMF, 2012) we can conclude that annual growth of Namibian economy is one of the lowest among sub-Saharan countries (see Figure 3 above) and not surprisingly, is highly correlated ($r=0.5299$; $p=0.0000$) with GDP dynamics of South Africa (see Figure 4 below).

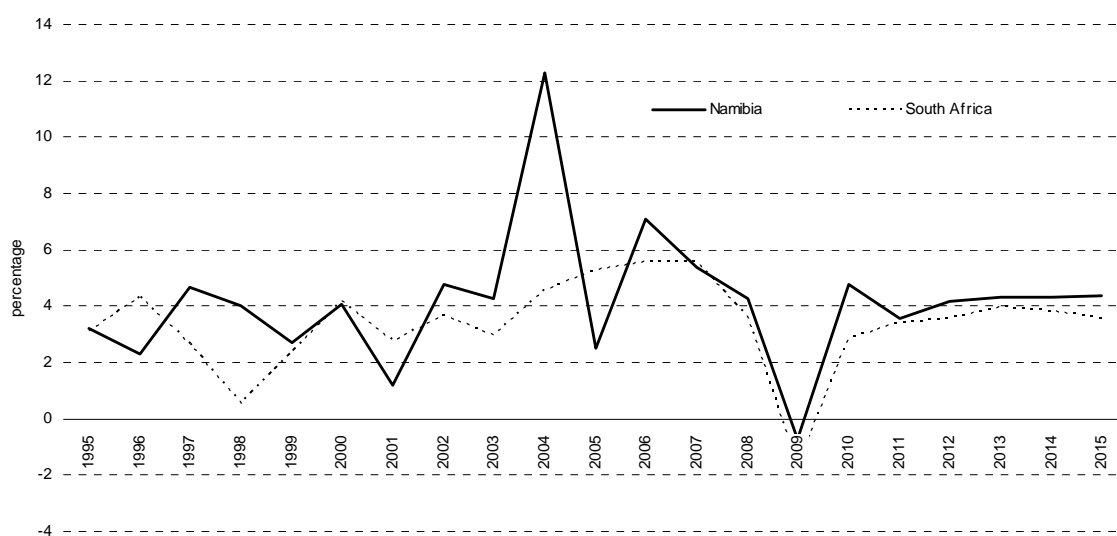


Figure 4 Annual growth of GDP in Namibia and South Africa (1995-2015)

Source: IMF (2012)

During 2007, persistent inflationary pressures were witnessed in Namibia as a result of high food prices, supported by high and volatile international oil prices. Increased food prices are attributed to the escalating cost of production, resulting mainly from rising fuel prices and other factors such as global milk shortages experienced during the year. In an effort to contain inflationary pressures, cites the Bank of Namibia. As a fundamental contributor to the Namibian economy, the country continues to be heavily dependent on the earnings generated from primary commodity exports in a few vital sectors, including agriculture fish and, of course, natural resources, such as minerals or diamonds.

In the context of minerals' input to GDP, the diamond industry has demonstrated itself to be one of the most vital industries in Namibia, contributing close to one tenth of national GDP, and employing a significant number of people (see Figure 5 below).



Figure 5 Employment by diamond mines

Source: Bank of Namibia (2008)

It is worth to be mentioned here that the government of Namibia has encouraged business enterprises to maximise benefits from primary resources by engaging in manufacturing activity, in order to increase added value to raw materials (Janiurek-Ashipala, 2005). In line with this effort, the Bank of Namibia (2008) reported that there was a significant improvement in the value added processes in manufacturing which was mainly reflected in the growth of meat, fish and other manufacturing sub-sectors.

2.2.2 Namibia's diamond industry performance in the international arena

In evaluating the importance of diamonds in Namibia, and the benefits derived, it is important to assess the performance of international diamond markets and their impact on Namibia's diamond industry. According to the KPCS (2007) Botswana, remained the largest producer of rough diamond followed by the Russian Federation and Canada coming in third place. South Africa and Angola came in fourth and fifth places respectively. Namibia tops amongst the high quality diamond producing countries in the world and thus making it an attractive destination for establishing polishing and manufacturing factories (Boer, 2003). Additionally, Lamont (2003) stressed that it is Namibia's unique diamond characteristics that makes the country attractive for foreign direct investment (FDI).

Despite of Namibia being a competitive advantage on the quality of diamond it produce, the country is known for exporting most of its rough diamonds to other parts of the world with little or even no added value (African Business, 2007). On the other hand, Reed & White (2006) argue that this situation is not strange as Southern African countries are commonly known for being exporters of rough diamonds to the European Union (EU), who, according to the KPCS statistics of 2007, continues to be the leading importer of rough diamonds. Other countries such as India, United Arab Emirates, China or Israel also play a prominent role in the importing of rough diamonds from the African continent. Most rough diamonds were exported from southern African countries which contribute 60% of world production. This skewed situation of rough diamond being exporter to European countries can only be reduced when the producing countries can explore the benefits derived from the diamond industry (Minerd, 1999).

2.2.3 Namibian diamond strategy

Sherbourne (2007) made the fundamental argument for Namibia to maximize benefits from its 'diamond industry'. He highlighted, there is a strong need to develop a national diamond strategy, highlighting amongst other priorities, concerns and ambition for the diamond industry and defined this strategy as "country's moves and approach that stakeholders employ to please the citizen of that country". Correspondingly, Thompson, Strickland and Gamble (2005) documented that this strategy should decide what direction Namibia wants to take in order for the diamond industry to move forward.

They however, suggest that it is only through the extensive exploitation of the value chain, and by creating a jewellery industry, that Namibia can really say that it is benefiting from the diamond industry.

Sherbourne (2007) also stress that there is a need to promote diamond tourism in Namibia by creating a worthwhile initiative where a number of diamonds could be sold to tourists who come to Namibia as “Namibia diamonds,” either because of their origin or where they were cut, polished and turned into jewellery. These programmes, they argue, could be concluded as spin-offs resulting from increasing of the diamond pipeline through the significant integration into the downstream of the value chain. Voss (1998) support the above argument, that to take the route of emphasizing that government must take a leading role in the process of beneficiation. The pair suggests that certain parameters must be met for the successful implementation of the national initiative by establishing national diamond development plans which should be supported by the official promotion of good governance and transparency, hence creating better sustainable diamond business development. (Simpson and Dore, 2004)

2.3 DIAMOND INDUSTRY AND POVERTY IN NAMIBIA

2.3.1 Poverty prevalence in Namibia

Generally, according to IFAD (2011) and UNDP (2011), Namibia is classified as a middle-income country. However at the same time, Namibia is one of the countries toping in the unequal distribution of income, which leads to a huge gap between rich and poor. (UNDP, 2011) stated that the poorest 10 percent of households command just one percent of the country’s total income whereas the wealthiest 10 percent control more than half. The government has seems to have a problem solving the unequal distribution of income. Since this has been going on for long and there is no improvement yet. Although there are a few wealth people in Namibia, like any other country there are middle class and poor people, the majority seems to be poor people. UNDP stated that about 27.6% of households are classified as poor and 13.8% as severely poor¹. According to (UNDP 2009) every second Namibian citizen lived below poverty line.

¹ Poverty is especially prevalent in rural areas.

There are many factors influencing the poverty ratio discussed in scientific journals, while HIV/AIDS is one of the most serious one².

2.3.2 Roots of poverty in Namibia

The situation on the field of poverty reduction is rather difficult in Namibia, as well as in the whole Sub-Saharan Africa. However, there are two findings that have to be highlighted in order to understand more in the details the roots of poverty in this country.

Firstly, the roots of poverty are quiet old and traceable at least back in the 1960s. IFAD (2011) stated that the social and economic imbalances of the apartheid system, introduced into Namibia in 1964 under South African rule, left a deep divide in Namibian society. The black population or local people were largely denied to access productive resources and basic infrastructure, while white settlers (former colonisers) had privileged and exclusive access to large areas of land and strong government support for their farming enterprises. Such structural inequalities have led to difficulties in reducing poverty as well. In communal areas, problems of conflict have arisen between poor farmers and better-off farmers who have fenced off land and access to water points. The land that was taken away by force during war remained with the former colonisers and it was never returned back.

Secondly, Namibian climate is very dry, which make any large-scale agricultural activities very dependent on natural and financial inputs. Degradation and desertification are also a threat to agricultural productivity. The economy is also held back by low demand for domestic products. Since there is lack of quality products produced in Namibia, and if they are, they are usually too expensive. As a result, Namibia depends in South African imports in almost everything. This makes the country highly dependent, underdeveloped in terms of vertical integration, which is necessary for any further development.

² In the past Namibia was among the top three countries in the world with highest rate of people living with HIV/AIDS. Despite of certain improvement of the situation, as now Namibia come 29th in the world, this epidemic is a major factor in the incidence of poverty and vulnerability among the population.

2.4 MINING, DIAMOND INDUSTRY AND THE ENVIRONMENT IN NAMIBIA

Mining activities have direct influence on natural capital capacity, quality use and sustainability. Poor management, low rates of return as well as investments to rehabilitation and appropriate techniques, the changes on environment could be irreversible. The diamond industry dominates Namibia's mining sector. Apart from its annual contribution of approximately 10% to the GDP, the diamond industry also contributes to government's state coffers through various taxes, statutory fees and dividends (Martin and Sherbourne, 2003).

Table 2 Key characteristics of the environment

Environment	Key characteristics
Biophysical environment	
Climate	➤ arid, coastal fog, strong southerly and south-westerly winds throughout the year, winter and summer rains are possible
Terrestrial habitats	➤ coastal and inland dunes, pans, rocky outcrops and gravel plains
Marine habitats	➤ sandy shore and rocky headlands, high energy coastline
Biota of conservation importance	➤ seals, seabirds, brown hyena, southern Namib endemic flora and fauna
Natural resources of economic importance	➤ rock lobster, fish ➤ diamonds
Socio-economic environment	
Land and marine use	➤ at present mining, seasonal rock lobster and other fishing, in future also tourism
Archaeology	➤ shell maidens of early to late stone age
History and culture	➤ shipwrecks, historical mine sites
Local economy	➤ fishing industry and large-scale and contractor based mining, as well as accompanying service infrastructure, provide the bulk of employment in the region
Infrastructure	➤ extensive network of rudimentary roads and tracks exists, some areas disturbed during earlier mining and sampling activities
Population and access	➤ lowest density of any region in Namibia ➤ no permanent settlements near the mining sites ➤ access restricted because of diamond security regulations
Social problems	➤ high levels of in-migration to Lüderitz ➤ HIV/AIDS ➤ alcohol abuse

Source: Namdeb (2009)

Mining plays a major role in contributing to the country's economy but, on the other hand, it can destroy the environment. For instance, diamond mining can lead to water pollution or land and air disturbance. By-products which occur in some metals are dangerous if it is released in the environment. Chemical substances and fuels that Namdeb³ use for mining process contribute to the pollutants. Furthermore the town is located at the coastal, there is the sea, the water is polluted and this can lead to the death of living things in the sea. According to Namdeb 2011, they have a mining licence and they own Oranjemund town thus accessing this town is strictly controlled even people who are Namibians, a registration and permit attained in advance is necessary before entering the town, almost like a visa going to another country. Furthermore, Namdeb has an existing, externally certified environmental management system (see table 2 above).

2.4.1 Diamonds

Diamonds are of significant importance to the economy of the country as they make up about a tenth of the entire economy. According to the Karas Regional Council (2011) Namdeb is the dominant producer partnership between the Namibian government and global diamond mining leaders then De Beers, which today mines an average of some 400 kg of gem diamonds a year, and then further north, in the coastal seas near Lüderitz, there is Namibia's a leading marine diamond company, Namco operates a cutting-edge offshore diamond mining operation.

Martin and Sherbourne (2003) stated that diamond mining has proven that 95% of Namibian diamonds are of "gem" quality. Namibia may be known as one of the top 10 producers of diamond in the world but the level of production is not sustainable. As the global demand for the diamond continues and there is no invented artificial substitute, in the future there will be neither diamond mining industry nor diamonds at all.

There is also little public information and discussion about the magnitude of Namibia's diamonds as the mines tends to keep this kind of information confidential. Below is a figure 5 showing the Namibian diamond timeline.

³ Namdeb prides itself as a dynamic diamond mining company owned in equal shares by De Beers Centenary AG and the Government of the Republic of Namibia. Namdeb's head office is situated in Windhoek, the capital city of Namibia (Namdeb Official Webpage, 2012).

Table 3 The diamond timeline

Diamond timeline	Year
Discovery of diamonds along the southern Namibian coastline Diamond mining regulations are introduced and the Sperrgebiet or (forbidden territory) is declared	1908
Sir Ernest Oppenheimer forms Consolidated Diamond Mines of South West Africa (CDM). Merging of the 10 largest German diamond mines in Namibia, by Ernest Oppenheimer with the financial backing of Anglo American, into the Consolidated Diamond Mines (CDM) of South West Africa, for the prospecting and mining of Namibian diamonds.	1920
CDM concludes the Halbscheid Agreement with the South West African Administration, granting CDM the mining rights for the Sperrgebiet.	1923
Oppenheimer and his Anglo American invited to become a member of the DeBeers syndicate. Oppenheimer becomes chairman in 1925 on account of the strength of CDM Holdings	1924
Prospecting and mining of Namibian Diamonds by CDM, with no direct benefit to the people of Namibia, who, at the time, were living subject to the South African apartheid regime.	1924-1990
Diamond mining operations cease at Kolmanskop	1930
The establishment of Oranjemund town, which was named after its geographical position at the mouth of the Orange River, the national boundary between the Republic of Namibia and South Africa.	1936
CDM Head Office moves from Kolmanskop to Oranjemund.	1943
First offshore mining concession granted.	1961
CDM Head Office moves from Kimberley to Windhoek.	1977
Formation of Namdeb – a 50:50 partnership between the Namibian government and DeBeers, for the prospecting and mining of Namibian diamonds. All of the DeBeers Group’s existing Namibian mining licences and related rights were replaced by a consolidated and rationalised mineral agreement, drawn up under Namibia’s post-independence mineral legislation.	1994
DeBeers agrees to set up a local cutting plant – NamGem	1998
Promulgation of the Diamond Act of 1999 providing government with the power to assign up to 10% value and 16% caratage of Namibian diamonds to local polishing and cutting companies (sight holders). Emergence of several cutting and polishing firms (mostly with foreign investment) into the diamond industry. However, DeBeers continues to resist efforts to create a local diamond industry in trading and cutting.	1999
Formation of NDTC – a 50:50 joint venture between DeBeers and the Namibian government. NDTC announces that it would sell 16% cuttable to established local companies (11 companies, 8 of which are DeBeers approved buyers, holding buying rights from DTC London.)	2007
Namibian government begins negotiations with DeBeers to take up full partnership in DeBeers Marine, in which it currently only holds a 30% shareholding.	2008
Project 2050 is initiated	2010

Source: Ministry of Mines and Energy (Namibia) 2010

2.4.2 NEW ERA – Namibia diamond trading company

Since it's well established that diamonds contribute significantly to the development of the Namibian economy, the Namibian government further stretched the beneficiation implementation by the formation of NDTC a 50/50 joint venture with De Beers in 2007. The agreement was to promote successful, sustainable and transformed diamond cutting and polishing industries in Namibia (Namibia Government Bulletin, 2008).

Therefore, a supply of rough diamonds to the local companies would maximise the benefits derived from local diamond cutting and polishing companies would have this commitment was to supply the local industries with 16% of the overall diamond carat, which equals 10% of diamond value. To this effect, the NDTC, as Namdeb's marketing partner, will sell aggregated rough diamonds to local companies as per the provisions of the partnership, as well as export to DTC International. Eleven local companies became beneficiaries to this agreement. The 10% benefits from the distribution allocation constitute the supply of a total of US\$ 38.3 million worth of diamonds annually to the local companies. It is envisaged that NDTC will be the primary vehicle for growth of the diamond beneficiation industry in Namibia. Expectations are that the level of turnover of local beneficiation could reach US\$ half billion by 2009 (Chamber of Mines, 2007; Sherbourne, 2007). Since the new sales agreement was signed into between the two parties, the benefits of the partnership have already made themselves clear, with NDTC having allocated an amount of about US\$ 3 million as shareholder dividends by the end of the first six month period (Penny, 2008).

The diagram below provides a simplified illustration of the DTC and NDTC approach to Namibian diamond beneficiation and old beneficiation system.

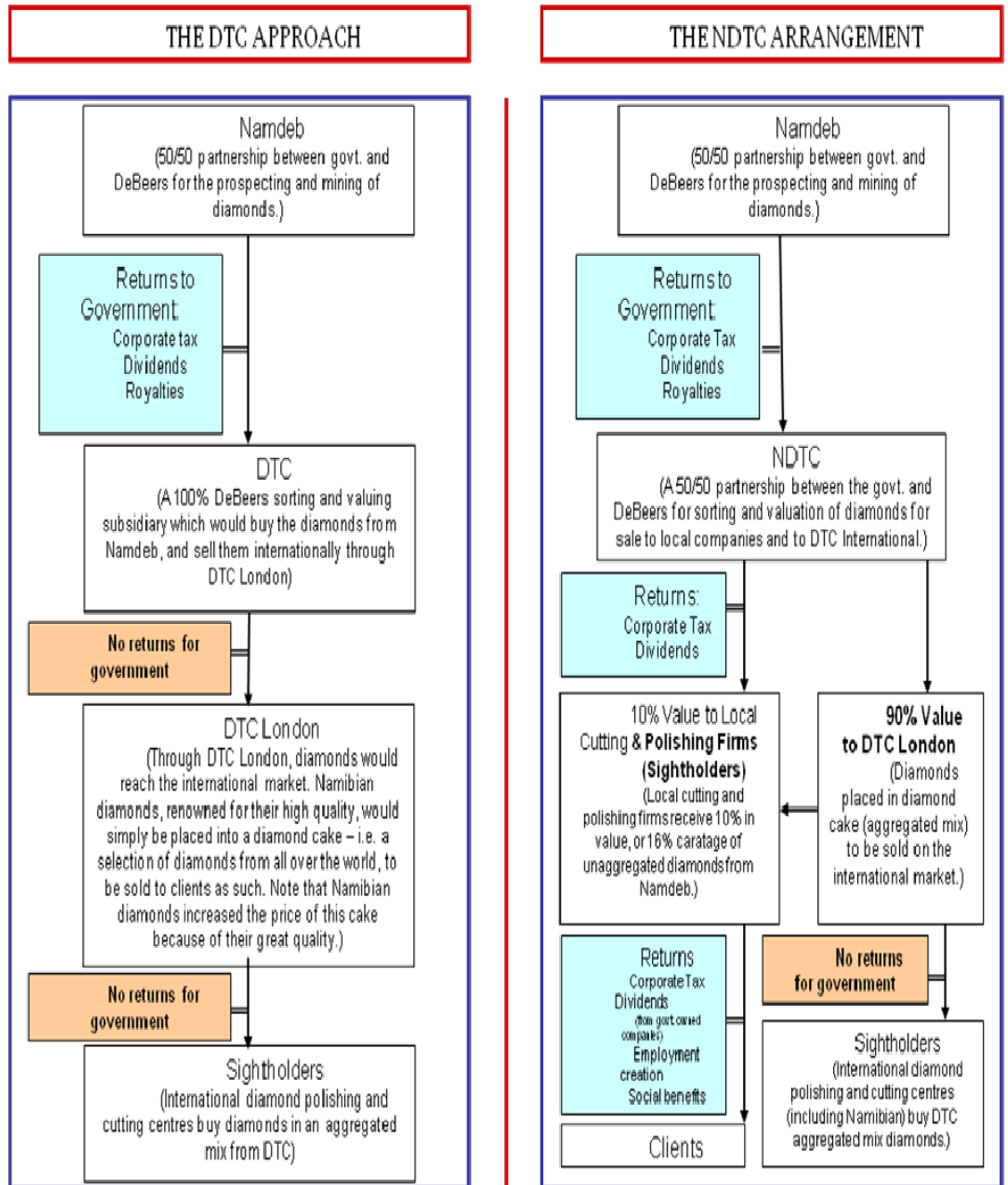


Figure 7 DTC and NDTC approach

Source: NDTC (2008)

2.4.3 De Beers

Voss (1998) stated that there is no other company as far as the diamond is concerned that has build its expertise in areas of exploration, mining and sales like De Beers ‘The De Beers company is the world's largest diamond miner, and holds a dominant position in the industry, having done so since soon after its founding in 1888 by the British imperialist Cecil Rhodes’ (Corbett, 2002). De Beers has become a powerful entity that controls production of diamonds, hence, proving to be one of the most successful multinational companies in the annals of modern commerce. De Beers owns or controls quiet a significant portion of the world's rough diamond production facilities (mines) and distribution channels for gem-quality diamonds. The company owns mines that produce about 40 percent of annual world diamond production (Janiurek-Ashipala, 2005).

De Beers encourages sustainable working to ensure long-term positive development for Africa, and returns approximately US\$ 4.7 billion to the continent every year (Penny, 2008). Namibia’s alignment with DeBeers, through the Namdeb Diamond Corporation Ltd (Namdeb), is therefore an important one in terms of expertise, marketing and value addition.

2.4.4 Lessons learnt from Botswana

As stated earlier, Botswana has always been one of the highest diamond producing countries in the world. Unlike Namibia, Botswana has continued to foster a culture of value addition to its diamonds, ensuring that not all rough diamonds are exported abroad (Baartjies, 2007). He further stated that the basic tenet of the country’s diamond development philosophy should be to optimize the benefits of revenues from natural resources by reinvesting them into developing further productive capacity of the economy such as education and training, health, infrastructure, and other sectors. Through a good management of Botswana’s diamond and other valuable mineral resources, the country today enjoys the benefits of a good health system, education, social and economic infrastructure, and a stable, uninterrupted, and democratic government (Cowell, 2003).

Oppenheimer (2008) stressed that one of the most important and attractive aspects of Botswana are the country’s determination to have honest and transparent government which

is a vital aspect in the diamond business. One of the important things lacking in the Namibian government is honesty.

There are still several corrupted politicians in Namibia who can also be the reason why the benefits delivered from diamonds do not reach many. It would be advisable for Namibia, to seek strategic partnership with Botswana, to learn on how Botswana has managed its diamond affair in the attempt of maximizing benefits derived from the diamond. It will be important for Namibia to investigate and evaluate some of the social and economic programs that Botswana has introduced in addressing the issue of diamond beneficiation in the country. Botswana is known for mining high volume of carats per year and has established unique sorting and polishing and manufacturing system in the country that Namibia can learn from. The assessment should focus on benefits that could be derived from mining, sorting and diamond manufacturing.

2.4.5 Environment, social and economic impacts

Mining plays a major role in contributing to the country's economy but it can destroy the environment, for instance it can lead to polluted water, land and air be disturbed, which are important basic needs to the habitants for living. By-products which occur in some metals are dangerous if it is released in the environment. Chemical substances and fuels that the mines use in the mining process contribute to the pollutants.

According to UN (2011), although there are benefits delivered from mining, such as employment creation and contribution a lot to the tax and GDP, there are still ranges of environmental and social impacts negatively affecting local communities, thus the sustainability of mining industry and the efficient use of its resources for development remain crucial. According to World Institute of Resources (2011), Biodiversity is also one of the impacts. And the most obvious impact to biodiversity from mining is the removal of vegetation, which in turn alters the availability of food and shelter for wildlife. They further elaborated that most mining operations use metals, reagents, or other compounds to process valuable minerals. Certain reagents or heavy metals, such as cyanide and mercury, are particularly valued for their conductive properties and thus are frequently used. Metals released into the environment can also be triggered by acid drainage or through accidental releases from mine tailings impoundments.

3. OBJECTIVE OF THE THESIS

Namibia is rich in mineral resources, including diamonds that are generally considered as a forefront of mineral wealth. But despite the fact that diamonds have been mined for over a century, the benefits have not reached ordinary Namibians at the grassroots level of society. This is attributed to the fact that before independence, diamonds mined in the country were all exported in rough form to international markets. In return, the country benefited from income generated from taxes and royalties, but lost out on developing a downstream diamond economy with the potential to create employment and generate increased income for the national economy. Moreover, there are doubts that distribution of benefits will be not fair at the national perspective due to high income inequality in Namibia and that mining regions will only produce the raw material without any positive impacts on poverty reduction or environmental conservation.

Thus, the objective of the thesis is to analyze the impact of diamond mining industry on the Karas region, which represents one of the most important mining areas in Namibia, on human and environmental development.

4. MATERIALS AND METHODS

The methodology employed in this study used both qualitative and quantitative data. Firstly, it took qualitative data by using secondary data from national development documents such as Vision 2030, NDP II and III, and the Kimberley Process Certification Scheme). Secondly, it took quantitative data by using primary data based on a structured questionnaire sent via email and social network site namely Facebook, where 70 questions were sent only to people living in Oranjemund and 49 respondents replied back.

4.1 STUDY AREA DESCRIPTION

The thesis is focused on Oranjemund town, where the NAMDEB diamond mine is located. According to the Karas Regional Council (2011), the Karas Region, whose name is assigned to reflect the prominence of the Karas mountain range is situated in the very southern part of Namibia and is considered as a natural organic administrative and economic unit. The following magisterial districts are included in the region: Keetmanshoop, Karasburg, Bethanie and Lüderitz. Karas borders with the shores of the Atlantic Ocean in the west and shares borders in the south and east with the Northern Cape Province of South Africa. In the north, It borders with the Hardap region. Karas is subdivided into six electoral constituencies namely: Berseba, Karasburg, Keetmanshoop Rural, Keetmanshoop Urban, Lüderitz and Oranjemund.

The Karas Region covers 161,235 square km, about 20% of the total surface area of the country. The Karas Region is the single most important mining region in Namibia. According to Namibian census 2010 the population of the region was 69,329.



Figure 7 Fish river canyon in Karas Region, Namibia

Source: Siyabona Africa (2012)

Karas's region is well known because it's rich in mineral resources. These include diamonds, zinc, copper, tin, lead silver, marble and gemstone. This makes it the most important region in Namibia. Karas Regional council (2011) stated that the mineral deposits contribute to the regional development in a way that it provides 27.5% of employment opportunities and some 12.5% of GDP. The region is a predominantly small stock farming area, consisting mostly of animals such as sheep or goats. There is also game farming and irrigation farming that can be found along the Naute Dam and the Orange River. Lüderitz is well known for its fishing and boat building industry, the diamond areas along the coast, both on and off shore, with Oranjemund as the main centre, mining enterprises in the southern part of Namibia (Klein Karas area, Rosh Pinah), the Kudu Gas field in the Atlantic Ocean near Lüderitz and small-scale industries in Lüderitz and Keetmanshoop. Although it is a dry area, there are some well watered agricultural zones. This is mainly due to the major feeds from the Orange and Fish and water catchments such as the huge Naute Dam. Certain crops such as lucernes, grapes, onions, maize, cotton and olives are cultivated on a commercial basis. There is potential for small-scale agricultural projects, along the banks of the Orange River, for local consumption in Oranjemund. The Hot Water Springs at Ai-Ais, the Kokerboom forest near Keetmanshoop, the Fish River Canyon which is the second largest in the world, the Brukaros Mountain (a former volcano) near Berseba, the coastal town Lüderitz and several guest and game farms are some of the main tourist attractions in the region. The economic growth potential of the area is considerable but needs an intensive general development policy. It is a profitable tax-generating area, which predominantly comes from diamond mining for the central government. A lot need to be done to improve the current development standard.

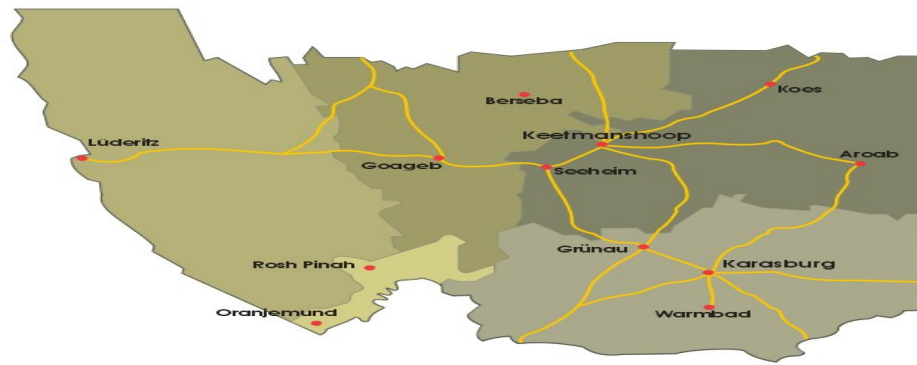


Figure 8 Study site: Karas region

Source: Karas Regional Council (2011)

Keetmanshoop is considered as the capital of the south and has direct air, railway and road links with the capital city, Windhoek. According to the Karas Regional Council (2011) its airport is of international standard and suitable for international air traffic. Unfortunately there is no tarred road linked to Oranjemund, the diamond town. The main railway line and two main trunk roads give access to South Africa. Karas region has well developed energy and water network and an advanced post and telecommunications system that link villages and towns with the rest of the country. Oranjemund has a well-developed water and electricity reticulation system. Water is obtained from the Orange River and electricity directly from Eskom, South Africa.

Karas Region is the most important mining region in Namibia. Namdeb, a diamond mine is the biggest followed by Rosh Pinah Zinc Cooperation and Skorpion Zinc are the most important mine in the region or country at large (Chamber of Mines of Namibia, 2007).

The Namibia Household Income and Expenditure Survey (2003/2004) stated that 73 percent of household income, in the Karas region is derived from salaries. Nearly a third of households live in poverty, spending more than 60% of their income on food alone. According to NPC (2008) Karas region in terms of poverty is doing much better compared to other 12 regions in Namibia. In 2004 the Namibian Gini-coefficient⁴ was 0.68 (NPC, 2008)

⁴ Gini-coefficient measures the extent to which the distribution of income among households in a country is diverging from a perfectly equal distribution. A value of 0 indicates a perfect equality while a value of 1 indicates a perfect inequality.

Gini-coefficient for Namibia is what indicated that the country is among the most unequal distribution of income in the world (as measured by household consumption expenditure). However the degree of inequality in the 13 administrative regions of Namibia differs. Each region has its own ranking. The lowest Gini-coefficients are found in Ohangwena and Omusati region at 0.45 and 0.46. The highest is in Hardap with 0.69 and Omaheke with 0.64. Kara's region can also be rated as one of the region with the highest Gini-coefficient at 0.61.

4.1.1 Natural conditions

According to Maplandia (2012) the diamond town Oranjemund, meaning "Orange mouth" in German, is situated in Sperrgebiet, in the extreme southwest of Namibia. Its geographical coordinates are 28°33'0" S, 16°26'0" E. Oranjemund share borders with South Africa, to the south, along the Orange River and on the western side, it shares borders with the Atlantic Ocean. While on the northern and eastern side, Oranjemund town shares borders with Lüderitz and Karasburg towns. Oranjemund occupies one of the most remarkable landscapes along the Namibian west coast or in Namibia in general. Oranjemund town was established in 1936, after diamonds were discovered on the north bank of the Orange River. Apart from the ocean and the river the town is located on the desert. There are so many different types of fauna and flora that is indigenous to the harsh environment of the Namibian desert.

4.1.2 Socioeconomic Overview

Apart from Oranjemund being rich in natural resources, the town faces numerous development challenges. Economic diversification of Oranjemund requires attention and need to be tackled to avoid loads of economic losses and social expenses. According to the GeoNames geographical database the population of Oranjemund, is 8496. Over 80% of the population is employed, with most of them being employed in the mining industry. Due to the diamond mined in Oranjemund, the town is Namibia's economic titan. However the town just like other regions in Namibia has poverty and inequality prevailing. Income per head in Oranjemund is seven times greater than those in Caprivi province, the poorest region in Namibia (Mwinda 2010). AIDS is the number one cause of death in Namibia. Although HIV/AIDS is all over Namibia, some regions have more number of people living with HIV/AIDS in comparison to others. This epidemic is one of the main factors that hold back the development of the country.

4.1.3 Overview of the ‘diamond industry’

Namdeb Diamond Corporation is Namibia’s number one diamond company. It’s located in Oranjemund, 890 kilometres from the capital city Windhoek. Namdeb is the largest producer of gem quality diamond in Namibia. It covers 15,789 square kilometres and holds six mining licences. Namdeb employs more than 3,000 people, this made it the second largest employer and the biggest tax payer in Namibia. Namdeb operates mainly in Oranjemund but also satellite mines in Luderitz and the Orange River. As mentioned above, Namdeb was affected by the economic crisis in the year 2009 but the company posted a strong financial performance in the following year 2010. The revenue increased due to strong recovery of the diamond market supported by an increase in average stone size. In 2010, Namdeb produced 1.47 million carats, compared to 0.94 million carats in 2009.

This included 0.98m carats from sea-based operations and 0.49m carats from land-based operations. The increase in production is mainly due to the return to continuous activity. The diamond is cut and polished at the diamond cutting and polishing factory named as NamGem in Okahandja, a subordinate company of Namdeb and it is structured with the most upgraded equipments. Okahandja is 830 kilometres from Oranjemund where the diamond mine is located. This factory of NamGem modifies eight-sided rough diamonds as “round brilliants”. 95% of the rounded diamond stones fabricated in NamGem factory are delivered to London.

4.2 DATA COLLECTION

Firstly, data on diamond mining and the national economy, in responds to the objective of the study, available data relevant to the study was reviewed. Literature was gathered from a variety of sources such as, documents published particularly by Namibian and regional government: Ministry of Mines and Energy, Namibia Planning Commission, Chamber of Mines of Namibia, Namibia Diamond Trading Company, Namdeb, DeBeers, Bank of Namibia and other journals, books, articles and government reports.

Secondly, data on diamond mining and environmental development were withdrawn from scientific databases, particularly Thomson Reuter’s ISI Web of Knowledge and Elsevier’s

Scopus and Science Direct via entering key words: ‘diamond’, ‘mining’, ‘rural development’, ‘environmental impact’, ‘national economy’, ‘Karas Region’ and ‘Namibia’.

Thirdly, data on socioeconomic development of Namibia as well as of target area were obtained from World Bank, International Monetary Fund, United Nations Development Programme and University of Pennsylvania (Penn World Table version 7.0).

Finally, background data and satisfaction of respondents with mining industry and their opinions about mining industry, were gathered via structured questionnaires, which were sent via email and social network service Facebook® to people who live in Oranjemund, the diamond town. The sample was selected randomly without any special requirements, the fact that they live in Oranjemund is enough. Questionnaire consisted of 18 questions. Choices of the questionnaire were both close ended and open ended questions, however they were all qualitative. Some of the questions were multiple choices.

4.3 DATA PROCESSING

Collected data were stored in MS Office Excel® and simple descriptive analysis were applied (means, standard deviations etc.). For correlation analysis, open-access statistical package GRETL (Gnu Regression, Econometrics and Time-series Library) version 1.6.0 was used.

5. RESULTS

5.1 DESCRIPTIVE STATISTICS

Male respondents dominated in the survey compared to females, because most of them work in the mines. Most of the respondents were of middle age, about 72% were younger than 40 years, 25% were between 41-60 years old and 3% were older than 60 years. Majority of the respondents confirmed that they lived in the target area between 6 and 10 years (41%). While 30% claimed living in the area between 11 and 20 years and 20% for more than 20 years and only 9% of them lived there for less than 5 years. Education levels were observed among the respondents, as only 10.2% reported to have higher education. While majority of them have only basic education. Most of the respondents lived in Oranjemund because of their job and their families lived in other towns. Although all respondents currently lived in Oranjemund, most of them originally come from rural areas, mainly from the northern part of Namibia, which is about 1,600 km far from Oranjemund.

65% of the respondents were married and their household income consisted particularly from their salaries. Some of them (45%) have family farms with prevailing subsistence production. Off-farm activities, such as small business, were observed among 38% of the respondents, particularly back in their town or villages of origin which are being run by their family while they are at work. Only 20% of the respondents were originally from urban area.

Questionnaire consisted of 18 questions. Choices of the questionnaire were both close ended and open ended questions, however they were all qualitative. Some of the questions were multiple choices.

5.2. Satisfaction with mining industry

Variables were selected according to the education level on their satisfaction with the mining industry. Majority of the respondents were satisfied with the mining industry and the main common reason it work. However most of the people who were very satisfied with mining industry are those with the low level of education. Below is the table with the results from questionnaire with the satisfaction of the mining. The satisfaction level ranges from 1 to 10. 1 being least satisfied and 10 being very satisfied.

A strong negative correlation between the mentioned above variables was observed ($r=0.9245$, $p=0.0000$). There was however a highly statistically significant. Thus, education does not influence satisfaction with mining, which is obvious looking at the results those with low level of education seems to be more satisfied with mining compared to those with high level of education. Refer to table 4 below.

Table 4 Satisfaction with mining according to level of education

Level of education	Rate	Satisfaction with mining
No education	0	9
Primary	1	9
Basic	2	8
Secondary	3	3
Higher education	4	2

Reasons for satisfaction with mining differ. Below is a table indicating reasons why the questionnaires are satisfied with mining.

Table 5 Reasons of satisfaction in percentage

Reasons for satisfaction	Percentage
Work	74.4%
economic development	15.3%
no reason	10.3%

There were also a few people who are not satisfied with mining. Below is a table indicating reasons why they were not satisfied.

Table 6 Reason of no satisfaction in percentage

Reasons for no satisfaction	Percentage
Health Problems	60%
Pollution	40%

Tables 5 clearly articulate that most of the respondents (74.4%) are satisfied with mining simply because of work, the fact that they work for the mine. There were a few respondents (15.3%) mainly those with higher education who are satisfied with mining because of the economic development it brings to the country. The remaining minority (10.3%) are satisfied with mining industry without having a proper reason to state.

Table 5 shows that the respondents who are not satisfied with mining, most of them (60%) its due to health problem resulting from mining activities, for example mine workers are required to be x-rayed every day when they enter and leave work, making sure they did not steal the diamond but this cause health problems and the rest (40%) it is because of the pollution caused by mining.

6. DISCUSSION

6.1 DISCUSSION OF THE RESULTS

Oranjemund as a diamond town is of significance important to Namibia economic wise. According to MME (2011) Oranjemund is one of the richest towns in Namibia but its economic development is not advanced. The diamonds mined hardly benefit the local people as over 95% is sent outside of the country mainly to London. In an article by Mwinga (2010) its indicated that mining industry contribute a lot to the Namibian economy and the country's development however most of the respondents feel that the benefits delivered from mining of natural resources does not as reach many Namibians as it should. It was noted in some articles that that most of the benefits delivered from diamonds do not reach Namibia. It was further stated in some articles that the government is busy finding a solution to this problem.

Most of the respondents have only basic education and they are employed in the informal sector. According to Karas regional council (2011) Oranjemund is the town with highest paid workers compared to other towns in Namibia. However, most of the respondents do not earn enough money for a living therefore some of them run small private business and small farm (mixed crop and livestock farming) besides working for the mining industry.

According to Macnair, 2011 mine workers tend to suffer from various diseases resulting from mining activities. The most common one is the industrial dust disease or pneumoconiosis, which a lung disease is caused by the inhalation of dust. Mwinga (2011) states that mining cause several health problems, however according to the interviewer's responses minority of them have no idea mining can lead to health problems. All of the interviewers happen to work for the mining industry and the majority support mining industry because they are employed in the mining industry apart from that they tend to see no other benefits delivered from the mining industry. Looking at various opinions from different interviewer's response on what

can be the main health problem for them since they work for the mine; different views from different respondents were elicited and noted accordingly. The majority of the respondents stated that the fact that they have to be x-rayed everyday can cause some long term affect on the health resulting in serious illness such as cancer, the minority are more concerned with safety, for example they think that rocks in the mine can fall on them. Although Martin (2001) stated that activities from mines damage the environment in several different ways, some the interviewers felt that the mining industry does not cause any harm to the environment. Some articles revealed that little marketing and promotion exists in the region to encourage the general public to get involved in the diamond industry. It was further shown that the only way for the public to feel a sense of ownership of the diamond industry is by sharing the natural custody of the diamonds. To this effect, there is a need for basic education to be afforded to the general public, to enhance awareness of the importance of diamonds to the Namibia economy and to highlight the benefits encountered by the citizens who participate in the downstream activities of the industry.

Most of the respondents seem to have a little understanding about diamond mine therefore experts from the government and De Beers need to pay attention on finding a solution to this. Mwinga (2010) stated that there is only little promotion and marketing about the diamond industry locally. Mwinga (2010) further stated that if the workers receive the opportunity to understand how the diamond industry functions, this will automatically unveil the mystery around the industry. The workers will also have the opportunity to question the current laws and policies and ascertain whether they are paid and treated fairly. It was stated in some articles that most of the Oranjemund residents work for the mining industry. This was proven right since all the respondents happen to work for the diamond industry.

According to some respondents and MME (2010) the fact that Oranjemund is far from other bigger towns in Namibia like Windhoek and Swakopmund affects its economic development potential. Moreover Oranjemund is a closed town and private location therefore entrance to the town is limited. And there is no tarred road accessing except if one has to go through South Africa. There is only gravel road that links the town to the rest of Namibia that passes through Rosh-Pinah. Mwinga (2010) stated that due to the poor quality roads several accidents occurred in this road. There are crosses next to the road which indicates the lives that were lost on that road. It is necessary for the new tarred road to be build to avoid accidents and

increase tourists attraction and business people who might be interested in visiting Oranjemund town.

Karas regional town council (2011) and minority of the respondents think that fact that the population of Oranjemund is too small lead to a serious economic weakness. However Janiurek (2006) stated that employment and income levels are relatively high in Oranjemund, compared to other towns in Namibia. Oranjemund town has an acceptable market size, with an extremely acceptable purchasing power. About 90% of the town's residents are employed. Because a permit to live in this town is necessary and there is no chance anyone can live there without proper reason. This is why they have lowest robbery. It is a peaceful town. There is sufficient buying power in the town to support the local businesses. However for one to be approved to have their business there it is very difficult. There are only very few fashion shops and supermarkets. These shops are extremely expensive since there is no competition.

There is really a need for more shops in Oranjemund. Because currently the cost of living in Oranjemund is high since there is no competition. Some people have to travel to go to South Africa for shopping. In this case its Namibia's loss because the people are not supporting local shops but rather going to support South Africa.

Janiurek (2007) further stated that there is global skills shortage in Oranjemund which affect the local economic development of Oranjemund. Most of people living in Oranjemund work in the mine. There is limited business opportunity thus highly qualified personal and entrepreneurs are not attracted to live in this town since it will be a challenge for them as there is lack of employment opportunities, sufficient goods and services also lack in the town. However there is more opportunity in the informal sector for unskilled or low skilled people to work in the mine (MME, 2011).

Some respondents think there is lack of infrastructure, for workers and businesses in the town. According to MME (2011) the infrastructure in Oranjemund is better compared to most of other towns in Namibia though. Maybe it could be more like lack of sufficient buildings that could be used to accommodate new businesses. There is also lack of accommodation which also leads to less people visiting the town. This prevents the town to attract tourists to visit the town.

Businesspeople, who wish to reside in the town, have to wait for extensive periods before suitable accommodations become available. This lead to them choosing other town instead of ever waiting for something that might not even happen. Like I mentioned earlier the poor gravel road linking to Oranjemund is also a problem. Especially, that many lives were lost in car accidents on that road. The government has not paid attention this as a serious matter because if they do they would reconstruct a new road, at least tarred road.

6.2 RECOMMENDATIONS FOR POLICY-MAKERS, DEVELOPMENT PROJECTS AND FURTHER RESEARCH

Karas region or Oranjemund town specifically is a big area with a small population, which is obvious since Namibia is a big country but the population is low. According to Karas regional council (2011) the region is blessed with many natural resources; if it was used and shared wisely the inhabitants will not suffer from poverty. For instance the unemployment rate in the region is just as high as other regions in Namibia. There is a need have large or more local diamond polishing and cutting companies in Karas region or specifically Oranjemund instead of shipping it to other countries to be processed. In support of the view that increased allocation of rough diamonds would enhance job creation opportunities not only in the region but as well as in the country at large. There is a need to revisit the formula of the system of allocating rough diamonds to polishing and manufacturing companies, to accommodate all the diamond characteristics. This process will enable the diamond town (Oranjemund) to polish goods of different colour, cut, and clarity and thereby develop unique skills and expertise dealing with the entire range of diamond goods.

The allocation should also take into account that Namibia produces a proportion of 95% of gem diamonds which could be used in jewellery, hence providing huge opportunities for promoting the downstream activities of the diamond industry. The current 10% of Namibian rough diamonds that are allocated to 11 local clients should be increased once the current companies have established themselves to be able to polish more diamonds and thereby benefit from economies of scale. In this way, they will also be able to compete with other prominent diamond polishing countries such as India and China as far as cost of labour is concerned. The further increase in allocation should reflect all the important diamond

characteristics such as clarity, colour and cut (shape) which all contribute significantly to value-addition.

Most of the respondents have only very basic knowledge about diamonds or mining although all of them are employed in the mining industry, most of them are only employed in the informal sector. The local people need to be educated about mining industry so they can have a better chance of having formal jobs in the mining industry. Recommendation to policy makers, in order to counter the problems posed by the lack of skilled labour, there is a need to establish a training academy through which diamond cutters and polishers can be trained, in order to develop the employee base for adding value to rough diamonds. The academy should in this way be a support base to the diamond industry by creating a pool of expertise that may be deployed in the diamond industry or subsequently be exported as experts to other parts of the world, and hence expand the knowledge economy of the country. The diamond academy will also play a fundamental role in exposing youth to the diamond industry, and in turn creating an interest in diamond matters and the industry's contribution to the overall economy. This will benefit citizens by enhancing the platform to acquire the necessary skills and relevant information for the participation in the mainstream activities of the diamond industry.

Oranjemund diamond town has been a very important player in the country's diamond industry, both locally and internationally. The town has a strong reputation not only in the country but as well as in the world for producing high quality diamonds. Therefore the town should take advantage of this competitive advantage by harnessing the development of the polishing and cutting industry and further exploring the vertical integrated diamond chain by creating value from jewellery design and from moving to retailing in addition to manufacturing.

The concept of diamond branding and marketing of Namibian diamonds mined in Oranjemund is important in developing the link between the diamond industry and other economic sectors in Namibia. For example, the diamond industry should create a link with the tourism industry, which is one of the fastest growing sectors in the country. The need to create a national diamond museum in Oranjemund town that will showcase the history of Namibian diamonds, Namibia's unique mining method (land and sea) and all the different characteristics of diamonds that are found in Oranjemund, cannot be questioned as a tangible solution to promoting the town not only as a diamond town but as well as a tourist attraction.

This process will boost both the diamond polishing and the tourism industry, because a significant number of tourists would be interested in finding out more about Oranjemund gem diamonds, and returning to their countries with a uniquely Namibian diamond.

Another natural link that can be explored between the diamond industry and other economic sectors is through the promotion of Oranjemund's fashion industry. By hosting international fashion events that centre on showcasing the beauty and value of Namibian diamonds, there is no doubt that a synergy between the diamond and fashion industries would serve to the benefit of the overall Namibian economy. Onshore diamond mining in Oranjemund is reaching the end of its cycle, and there is a real need to find innovative strategies to assist in finding new deposits, so that the diamond industry can be sustained.

Policy makers should create monetary incentives by establishing a National Diamond Deposit Policy, which will see to it that funds are made available through the Development Bank of Namibia, to subsidize all new diamond exploration taking place in the diamond industry. Through government intervention in this regard, foreign direct investment will be attracted into the country and can result in the discovery of new diamond deposits, which will create employment. New deposits will also accelerate the establishment of the downstream industry in the region.

Importantly, the government should also seek the opportunity to increase its current 30% stake in De Beers Marine Namibia so that increased allocations of rough diamonds to the local diamond polishing and cutting industry can be effected. The mining industry need to pay attention to the environment. Regional council and communities should support and pursue economic development that maintains or improves the environmental and avoid that harm the environment and public health. There is a need to protect the environment. In this regard the government and DE Beers should come to some agreement on how they can protect the environment. Regional council together with the government should pay attention to the lack of important facilities missing in the mining town such as infrastructures, markets, education, business opportunities and roads. This can attract investors and people who are skilled to move to this town and uplift the mining industry and the development of the town.

Oranjemund, being a diamond town made it so unique in many different ways so there are many opportunities for development projects to improve the current situation of the diamond

town. Moreover recommendations for future research would be to visit the town and conduct face to face interviews with not only workers in the mining industry but as well as those who live in the diamond town but they do not work in the mining industry sector and collect data from the books and journals and the National Library of Namibia and University of Namibia since there is no so much data regarding this topic on the internet sources, so in future to improve the outcome of the research paper.

6.3 LIMITATIONS OF THE STUDY

One of the major limitations of the study is that not many people in Karas region or specifically in Oranjemund town have only a basic understanding of the importance of mining industry or specifically diamonds to the Namibian economy, let alone their value to the lives of ordinary Namibians. The director from the Ministry of Trade, division of Mining as well as Namdeb refused to provide with some useful information the reason being, mining information is confidential. The absences of this real information gave a hard time because such kind of information's might have influenced the outcome of this paper.

The second limitation was that the amount of Namibian literature on the mining of diamonds in Oranjemund is limited, and so while the study focused on Oranjemund. Another limitation was financial; the researcher would have and wanted to travel to go to Namibia to interview the interviewees personally but due to financial problems the researcher could not go. It is believed that the researcher could get more respondents and additional literatures from Namibia.

Finally, with regards to soliciting information on Namibia's diamond industry, a cloud of mystery surrounds the topic and the diamonds themselves, thereby limiting the amount of information gathered from the interviewees for the purpose of the study. Despite these limitations, however, a number of viewpoints were collected, and the information emerging from the literature review and the questionnaire have been invaluable in making various recommendations on.

7. CONCLUSION

In conclusion, diamonds are important and the government needs to pay more attention to them. Oranjemund (the diamond) town is the most protected town in Namibia but this does not mean that the diamonds are fully protected and no thief or illegally business is taking place. Corrupted and selfish politicians need to stop corruption and pay more attention that the benefits delivered from diamonds reaches the Namibia nation and not just certain people. Oranjemund is a special diamond town but it very surprising how the economic growth and development is slow. This is simply due to less attention that is paid to the town by government officials. There are no enough education institutions in the town, lack of infrastructures and market and many other important factors for a living. Poverty tends to be thriving in the town or region at large where the diamond is mined.

It is also evident from the literature to the structured interviews that for benefits delivered from diamonds to be fully maximized, the current legal framework in place should be implemented in a timely fashion to address the issue of beneficiation effectively. It was suggested that De Beers and government should take a leading role in marketing and promoting the importance of Namibian diamonds to the economy, so as to encourage a broader participation of local downstream activities in the industry.

Mines do not really consider the danger that can result from the pollution delivered from mining industry; therefore mines should pay attention to the environment and try to use chemicals that are less harmful to the environment than others. Most of the Namibia people have no basic knowledge about the mining industry. It is necessary for them to know about it so they can be part of it.

Lastly, the need to explore other avenues to find new deposits is crucial in the wake of the depleting reserves from traditional land operations, thereby having a negative impact on the beneficiation process in Namibia. For one to be able to answer the question on how the benefits derived from the diamond industry should be maximized, it is evident that many factors need to be considered before a solid answer is provided.

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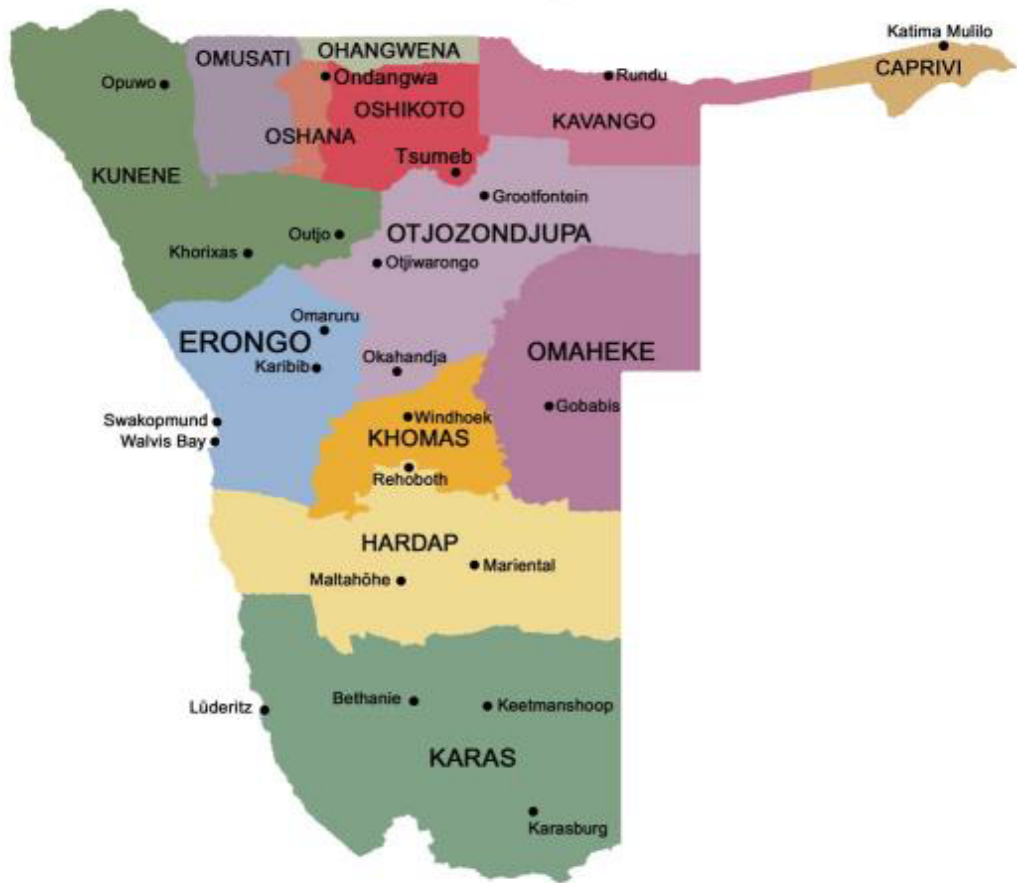
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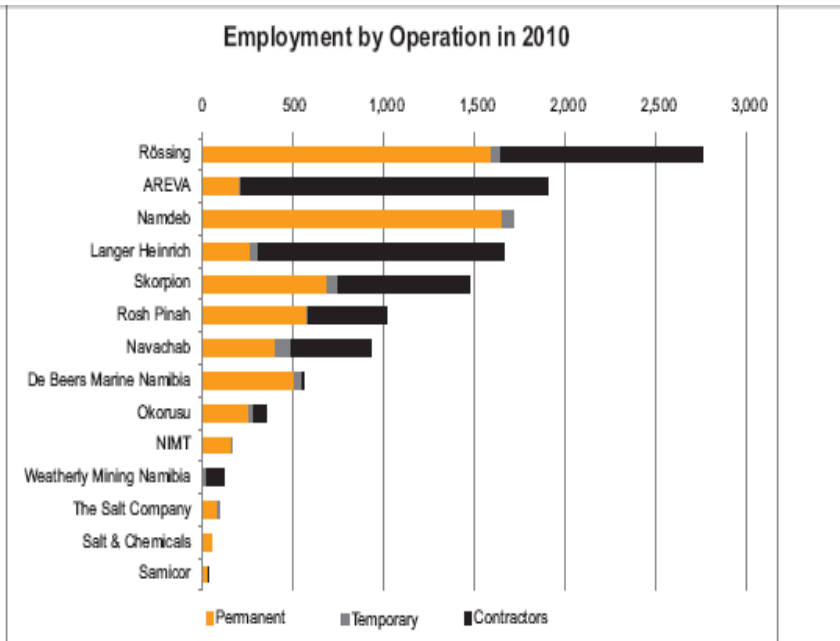
Annex 1 Overview of the 'diamond industry' in the world

Source: Google maps (2011)



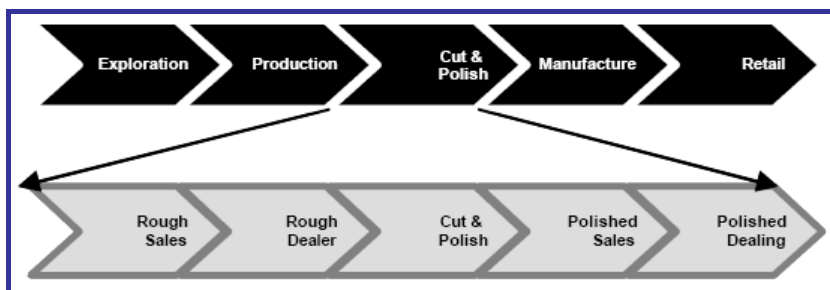
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Annex 3 Employment in mining industry in Namibia

Source: Chambers of Mines, 2011



Annex 4 Simplified Diamond Pipeline

Source Baartjies, 2007

Annex 5

Questionnaire

This questionnaire is for academic purpose, therefore there will not be any private information spread out.

1. Age

2. Sex

- a. Male b. Female

3. Marital Status

- a. Single b. Married

4. Education level

- a. None
b. Primary
c. Basic
d. Complete secondary
e. Higher education

5. What is the main source of your household income?

- a. Salary from a private company
b. Agriculture(farm)
c. Salary from a governmental organization
d. Salary from a mining company
e. Own business
f. Other

6. Origin, from which region and town are you?

7. If you have a farm, please write down where it is located and your off farm activities?

8. Duration of stay in the Oranjemund?
 - a. Less than 5 years
 - b. 6-10 years
 - c. 11-20 years
 - d. More than 21 years

9. Do you think mining produce some sort of health problem?
 - a. Of course
 - b. Maybe
 - c. Not at all

10. Are you satisfied with mining industry?
 - a. Yes
 - b. No

11. Give your reasons for supporting or not supporting Mining Industry?

12. What do you think need to be improved in the diamond town (Oranjemund) and Why?

13. Do you think that mining is affecting the environment?
 - a. Yes
 - b. No

14. What are the environmental impacts caused by mining activities which have any effects for your living?

- a. Land degradation
- b. Air pollution, dust
- c. Water pollution
- d. Water evaporation
- e. Noise
- f. None

15. How will you define the health system in your region?

- a. Very poor
- b. Poor
- c. Good
- d. Very good
- e. I don't know

16. According to your own opinion, what do you think is holding back the development of Oranjemund?

.....

17. How is the mining industry important to you? Do you think you benefit from it?

.....

18. Please write down if you have any complaints or health problems caused by mining activities.

.....